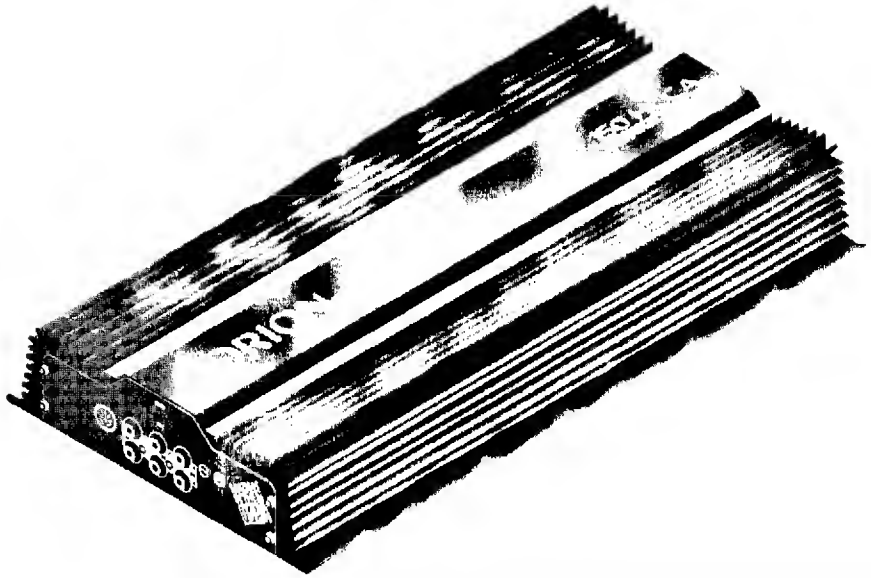
150 HCCA COMPETITION AMPLIFIER MANUAL



ORION
HIGH PERFORMANCE CAR AUDIO

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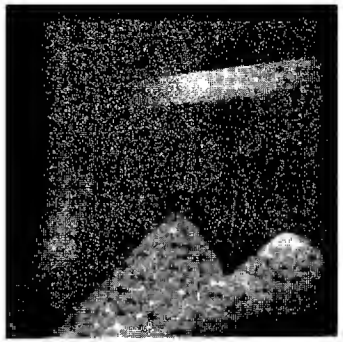
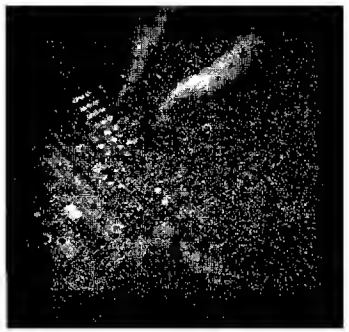


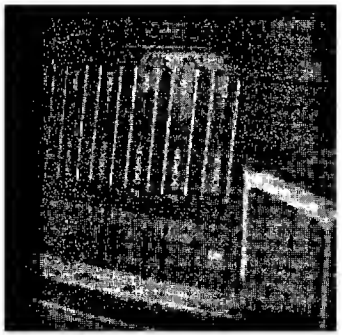
DESIGN

All ORION amplifiers are designed on our sophisticated CAD system, utilizing the latest technology available.



PRODUCTION

All ORION amplifiers are made in the USA, with high-quality, double sided PC boards containing superior grade components.



PRODUCT USE

The ORION amplifiers set new standards for performance and reliability. They can attain sound pressure levels well in excess of 130 dB. Use common sense, and wear hearing protection when appropriate.

INTRODUCTION

Welcome to ORION. Thank you for purchasing the 150 HCCA. The 150 HCCA sets new standards for competition excellence. Optimized for sound-off competitions, the 150 HCCA is a 4 channel amplifier with awesome dynamic headroom. The amplifier features a hybrid PRS power supply design that delivers 2 channels of the amplifier power rated @ 25 watts x 2 into 4Ω (capable of 0.5Ω stereo operation) and 2 channels of amplifier power rated @ 50 watts x 2 into 4Ω (capable of 2Ω stereo operation). The dynamic power capability of the 150 HCCA is rated at 800 watts! To control the audio signal, the 150 HCCA includes two DVX-2 modules for ultimate system control and flexibility.

FEATURES

High-current channels

- 25 watts x 2 into 4Ω. Rated down to 0.5Ω
- Dynamic power of high current section is 400 Watts.

High Voltage channels

- 50 watts x 2 into 4Ω. Rated down to 2Ω.
- Dynamic power of high current section is 400 Watts.

General

- Dual staggered PRS power supplies
- Dual DVX-2 crossover modules
- Meets IASCA power classes (1 amp in the 1-150 watt class, 2 amps in the 151-300 watt class, 4 amps in the 301-600 watt class)
- Total dynamic power of 800 watts.

ABOUT THIS MANUAL

This manual is divided into different sections for different needs. Whether you are the owner, salesperson or installer, we have devoted a section of this manual to answer your questions. If you have not decided on a system design, refer to the "SYSTEM PLANNING" section of this manual for awesome system ideas. For quick installation references, please refer to the "QUICK REFERENCE INSTALLATION" section of this manual.

We at ORION strive to give you the latest up to date information about this product. If you have question regarding the installation, set-up or tuning of this product, please refer to your nearest Authorized ORION Dealer for assistance. The direct access to ORION's Technical Support Hotline is 1-800-315-2080.

WHAT'S IN THE BOX

Listed below are the components included in this system package

quantity	description
1	150 HCCA amplifier
2	DVX-2 Crossover Modules
1	installation and operation manual
1	8 gauge power and ground connector
1	12 gauge speaker and remote connector
4	#8 self-tapping black Phillips pan head screws
2	40 Amp ACT fuse

TECHNICAL DESIGN FEATURES

- **Dual PRS MOSFET power supply**- (Pulse Regulated Supply) The heart of the 150 HCCA amplifier. It supplies the power needed to reproduce the music. Music is not a continuous demand but a dynamic demand. The PRS power supply allows the 150 HCCA to quickly react to current demands created by musical transients. The PRS supply has a low output impedance for superior damping control and stability during voltage fluctuations for continuously reliable performance in the harsh automotive environment.

- **Complimentary matched Bi-polar outputs**- The150 HCCA amplifier uses complimentary bi-polar output devices. These complimentary devices are symmetrically matched to ensure the output section behaves in a ultra-linear fashion. When outputs are not precisely matched, the result is non-linear clipping of the amplifier that causes audible distortion when running the amplifier at near maximum output capabilities.

- **Four Module Slots with dual DVX-2 Modules**- The 150 HCCA is equipped with four module slots for unlimited system flexibility. Dual DVX-2 Modules creates ultimate system flexibility with the ability to create 12dB/Octave or 24dB/Octave high-pass or low-pass filters or 12dB/Octave band pass filters.

- **Internal Signal routing and Summing**- The Input signal can be routed back out the amplifier via the DIN plug or RCA jacks. The signal can be routed through the internal DVX-2 modules or be configured for full-range output. The signal can also be summed mono for subwoofer applications.

- **MASTER/SLAVE**- The internal gain stage of the amplifier can be bypassed so that one master amplifier can be used to control the gain of a slave amplifier. This operates on channels 1 & 2. This system can be used with multiple low-frequency amplifiers to perfectly level match the system.

- **Direct Drive**- The gain stage of the amplifier can be bypassed for improved sound and a 10dB increase in signal-to-noise ratio.

- **Removable Top Panel**- This provides easy access to the module slots and signal jumpers.

- **Multi-level input capability**- The Concept 97 1 is designed to accommodate all different types of source units. An input range from 150 mV to 5 Volts rms is required to achieve full power output. Your Concept 97 1 will maximize the sonic capability of your OEM (original equipment manufacture) or aftermarket source unit.

- **Tri-Mode**- The Concept 97 1 has the capability of running a stereo output with 2 channel while bridging across them for a bridged output at 4 times the stereo power for a dedicated 4Ω. Designed to work with the CSX-TMC available from WIRED! , Tri-Mode make subwoofer systems affordable and easy to install.

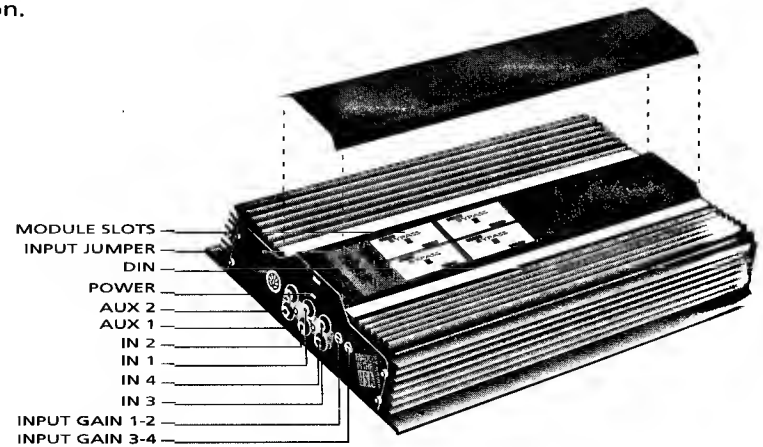
- **Large Efficiency Anodized Heatsink**- Large C' n C' machined high efficient anodized aluminum heatsink incorporates a large surface area allowing components to run cooler and more efficient for maximum performance and safe operation.

- **Military Spec. Double Sided Plated Through Circuit Boards**- All ORION circuit boards are reinforced with Nickel and plated through for greater reliability with through hole parts.

- **Parallel 8 Pin DIN and RCA Inputs/Outputs**- Amplifiers can be linked together using DIN or RCA connectors for easy connection in multi-amp systems. The 8 pin DIN connectors are backwards compatible with all previous ORION amplifiers, crossovers and pre-amplifiers.

- **15 Volt Phantom Power supply**- On-Board power supply for external orion signal processors eliminates grounding problems that can cause engine noise in the system.

- **No (Audio) Current limiting Circuitry**- The amplifier will produce more power into lower impedance without going into early protection.



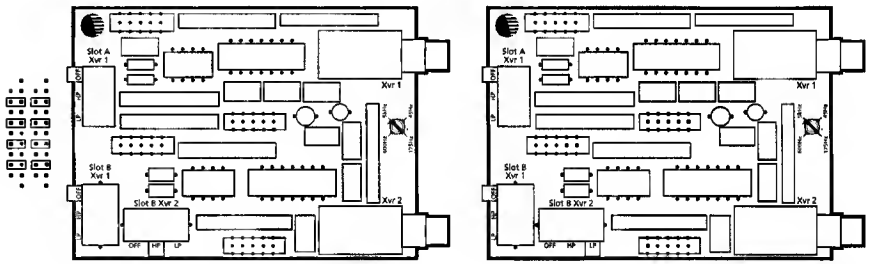
SYSTEM PLANNING

The Concept 97 1 meets the power requirements that allow one amplifier to be used in the 0-150 watt class, two amplifiers in the 151-300 watt class and four amplifiers in the 301-600 watt class. The following system designed are suggestions to maximize each power different classes.

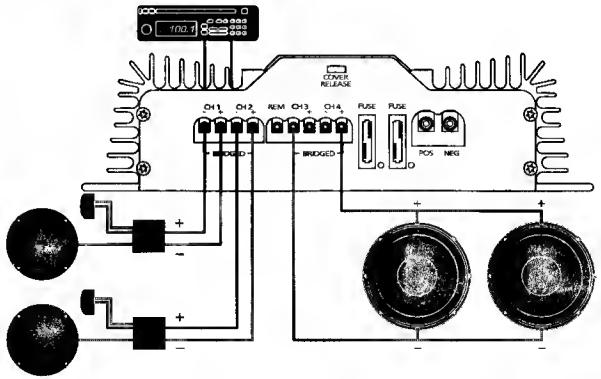
SYSTEM 1

This system is designed to use a pair of NT 5S separates on channels 1 & 2 and 2 NT 12 DVC on the bridged channels 3 & 4.

Jumper and Module Configuration



Input & Output Configuration

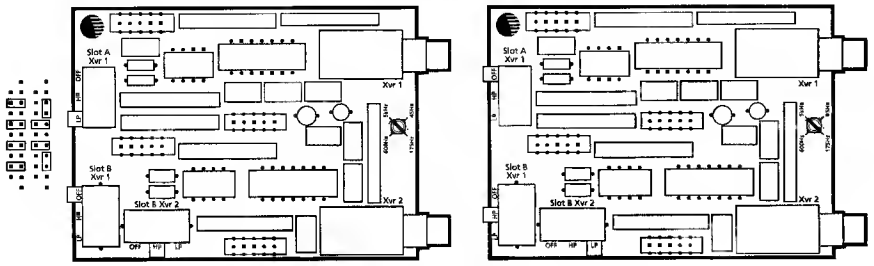


- IASCA Rated Power is 150 Watts
- Dynamic ORION Power is 600 Watts
- Channels 1 & 2 is operating high-pass at 4Ω per channel stereo
- Channels 3 & 4 is low-pass bridged into 1Ω
- 2 channel input is used
- Independent gain control for channels 1 & 2 and 3 & 4
- Output for channels 3 & 4 are summed-mono

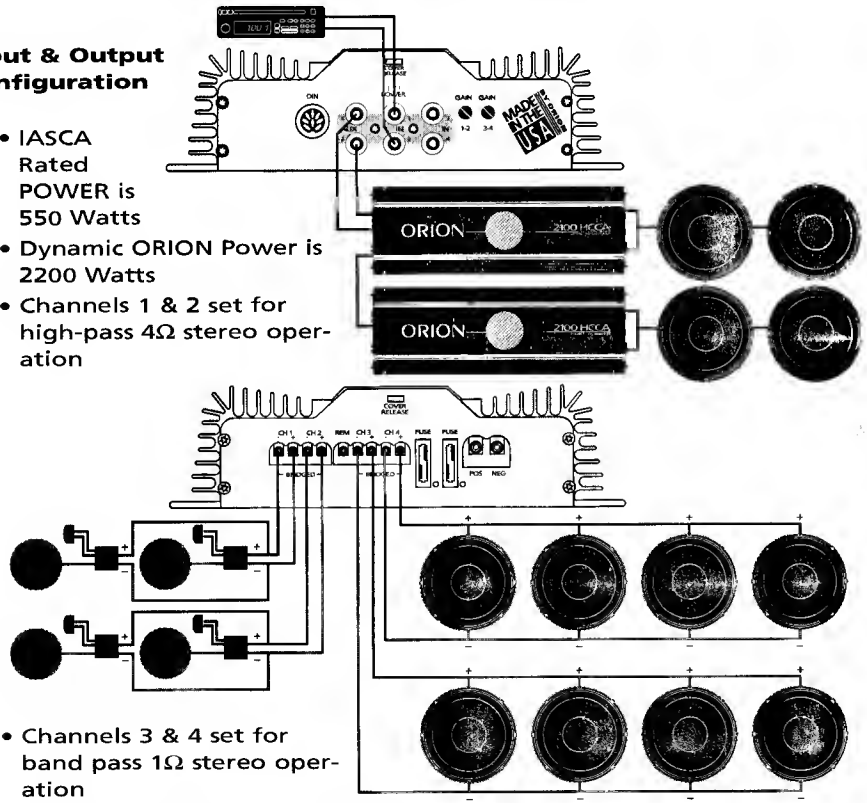
SYSTEM #2

This is a system using a single Concept 97 1 routing signal out to 2 2100 HCCA amplifiers for SPL competition. This will place the system in the 600 watt power class. The satellites are a pair of NT 5S components speakers and 4 pair of XTR 6MB for midbass.

Jumper and Module Configuration



Input & Output Configuration

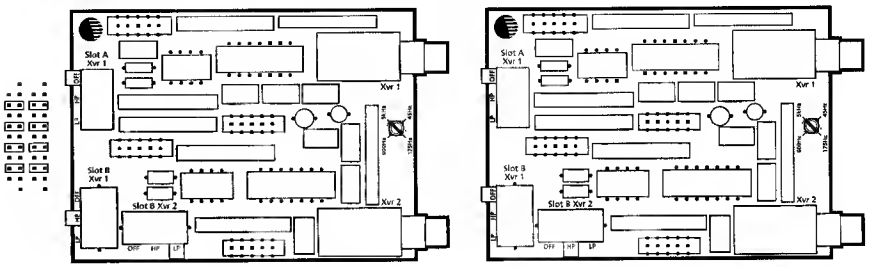


- IASCA Rated POWER is 550 Watts
- Dynamic ORION Power is 2200 Watts
- Channels 1 & 2 set for high-pass 4Ω stereo operation
- Channels 3 & 4 set for band pass 1Ω stereo operation
- AUX out is set for low-pass to 2 2100 HCCA for 4 15" NT subwoofers
- Concept 97 1 is set for 2 channel input.

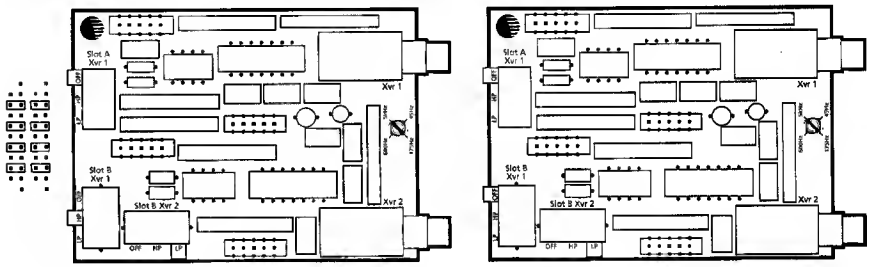
SYSTEM 3

This system uses two Concept 97 1 amplifiers for the 300 watts power class. Amplifier 1 drives a pair of NT 5S component speakers in a Bi-amplified mode. Amplifiers 2 drives a pair XTR 6 MB drivers and 4 NT 10 SVC woofers.

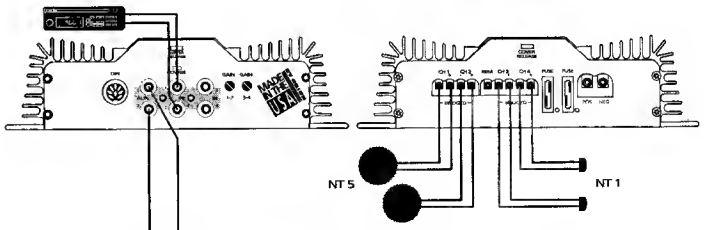
Amplifier 1 Jumper and Module Configuration



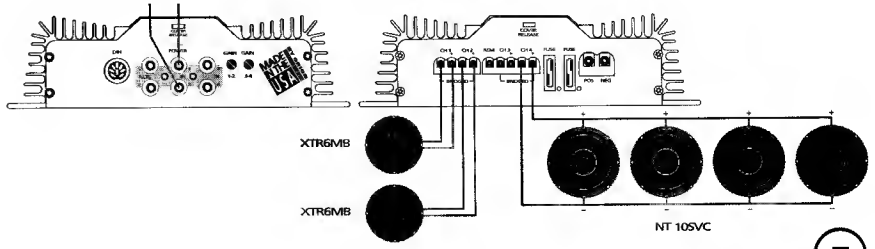
Amplifier 2 Jumper and Module Configuration



Amplifier 1 Input & Output Configuration



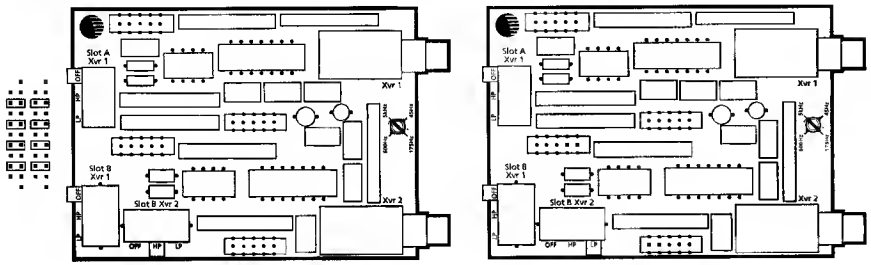
Amplifier 2 Input & Output Configuration



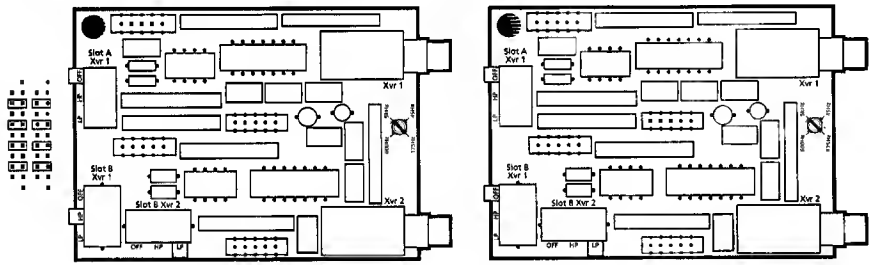
SYSTEM 4

System 4 uses 2 Concept 97 1 amplifiers in the 300 watt power class. This system is general for high SPL. Amplifier 1 drives 2 pair of NT 1 tweeters and 4 XTR 15 SVC woofers. Amplifier 2 drives 4 NT 6 midranges and 4 XTR 15 SVC woofers.

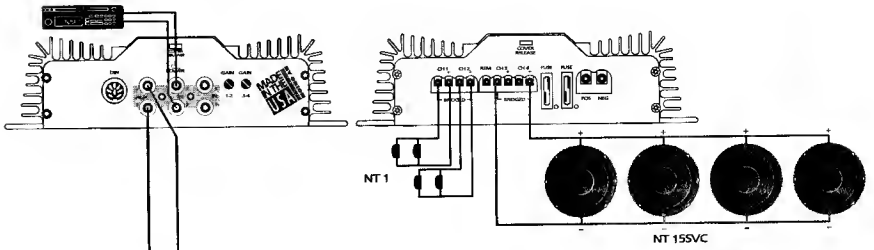
Amplifier 1 Jumper and Module Configuration



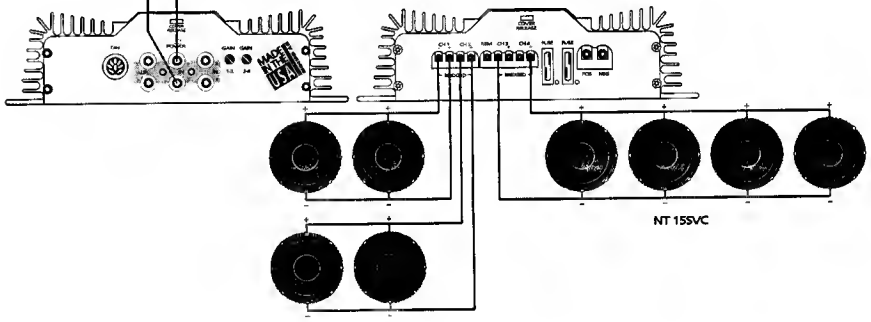
Amplifier 2 Jumper and Module Configuration



Amplifier 1 Input & Output Configuration



Amplifier 2 Input & Output Configuration



- IASCA power 300 watts
- Dynamic Orion power is 1600 watts
- Amplifier 1 channels 1 & 2 set for high-pass 2Ω stereo operation
- Amplifier 1 channels 1 & 2 set for low-pass 1Ω stereo operation
- Amplifier 2 channels 1 & 2 set for band-pass 2Ω stereo operation
- Amplifier 1 channels 1 & 2 set for low-pass 1Ω stereo operation
- Both amplifiers set for 2 channel input
- Amplifier 1 AUX output set to full range output.

INSTALLATION

The installation of all ORION components will determine the overall performance result. Improper installation will not only limit the performance of your ORION system but also reduce the reliability of this amplifier. To ensure proper performance and component reliability, please refer to your Authorized ORION dealer for installation assistance and advice. If you decide to perform the installation yourself, read the entire installation section of this manual before beginning the installation.

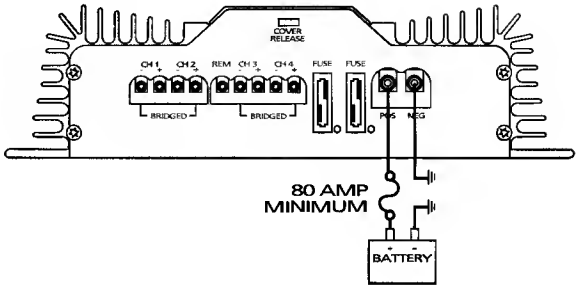
TOOLS FOR THE TRADE

Listed are the majority of tools required to perform the installation. Having the proper tools will make the installation much easier. It is very difficult to get half way through the installation and discover you require a tool to complete a particular part of the installation. Some of these tools are necessities. Some make the job much easier.

- marking pen
- electric drill with assorted drill bits
- utility knife
- Phillips and flat blade screw drivers
- pliers (standard and needle nose)
- wire brush or sandpaper for chassis grounding
- solder iron and solder
- grommets
- heat shrink tubing
- nylon tie straps
- volt ohm meter (optional)
- wire cutters
- wire crimpers
- wire strippers

QUICK REFERENCE

power connections

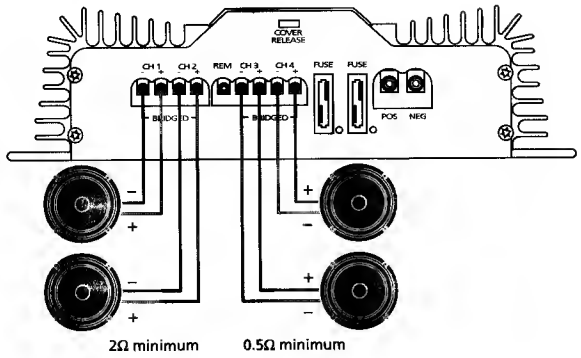


- Minimum 8 Gauge power and ground cable
- Recommended fuse size dual 40 amp ATC
- Fuse power wire less than 18" from battery
- Ground amplifier to a good chassis ground as close as possible to the amplifier
- Add Extra Ground wire between the negative terminal of the battery and the chassis

NOTE: The addition of a ground wire from the battery to the chassis of the vehicle improves the ability of the battery to supply power to the amplifier. This helps especially in newer vehicles, where the current delivery of the factory electrical system was designed only to accommodate electronics supplied by the auto manufacturer.

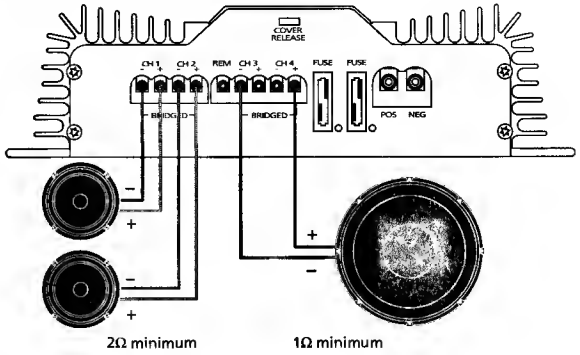
SPEAKER CONNECTIONS

Four Channel Stereo Configuration



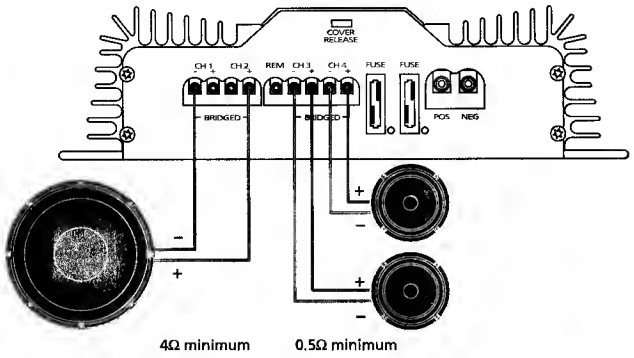
- Lowest recommended impedance for Ch 1 & 2 is 2Ω per channel stereo.
- Lowest recommended impedance for Ch 3 & 4 is 0.5Ω per channel stereo.
- Crossover, output and gain configuration are independently adjustable between the front and rear channels.
- 2 Channel or 4 Channel input can be used for this configuration. For source unit fading, used the 4 channel input mode.
- Front and rear outputs can be configured for high-pass, low-pass, band-pass or full range operation.
- Front and rear outputs can be configured either for stereo or summed-mono operation for subwoofer applications.

Three Channel Stereo/Bridged Configuration



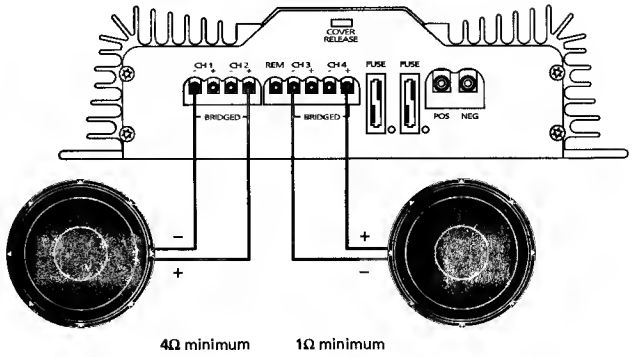
- Channels 1 & 2 are configured for two channel stereo operation. Lowest recommended impedance is 2Ω per channel.
- Channels 3 & 4 are configured for a single channel bridged output. Lowest recommended impedance is 1Ω bridged mono.
- Crossover, output and gain configuration are independently adjustable between the front and rear channels.
- 2 Channel or 4 Channel input can be used for this configuration. For source unit fading, used the 4 channel input mode.

Three Channel Stereo/Bridged Configuration



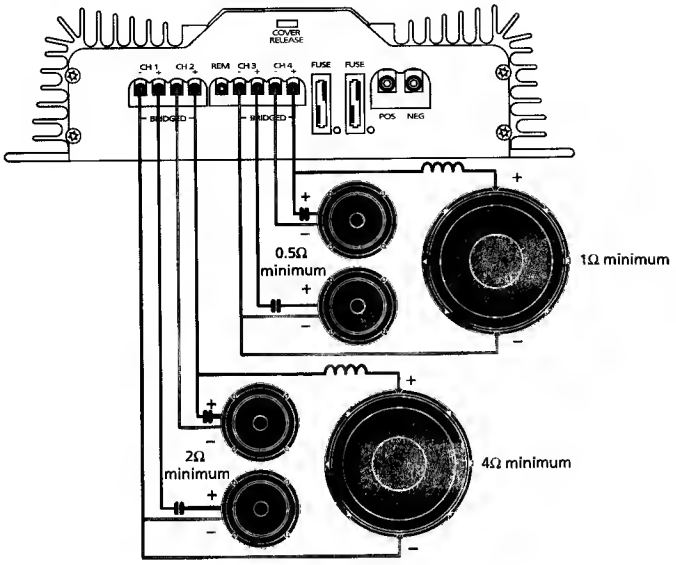
- Channels 3 & 4 are configured for two channel stereo operation. Lowest recommended impedance is 0.5Ω per channel.
- Channels 1 & 2 are configured for a single channel bridged output. Lowest recommended impedance is 4Ω bridged mono.
- Crossover, output and gain configuration are independently adjustable between the front and rear channels.
- 2 Channel or 4 Channel input can be used for this configuration. For source unit fading, used the 4 channel input mode.

Two Channel Bridged Configuration



- Channels 1 & 2 and 3 & 4 are configured for bridged mono operation.
- Lowest recommended impedance for channels 1 & 2 is 4Ω bridged-mono.
- Lowest recommended impedance for channels 3 & 4 is 1Ω bridged mono.
- Crossover output and gain configuration are independently adjustable between the front and rear channels.
- 2 Channel or 4 Channel input can be used for this configuration. For source unit fading, used the 4 channel input mode.

Tri-Mode Six Channel Operation



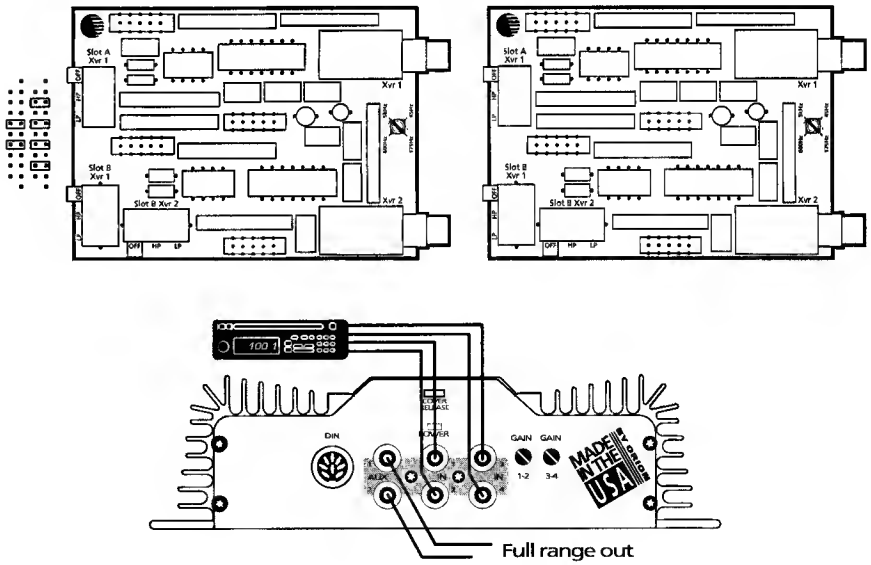
- Lowest recommended impedance for channels 1 & 2 is 2Ω per channel stereo and 4Ω bridged mono.
- Lowest recommended impedance for channels 3 & 4 is 0.5Ω per channels stereo and 1Ω bridged mono.
- Front and rear outputs must be set for full range operation.
- Channels 1 & 2 and 3 & 4 must be configured for stereo full-range operation.
- Passive crossover frequencies must not overlap.

WARNING: Passive crossover overlaps may cause damage to the amplifier.

SIGNAL CONFIGURATION

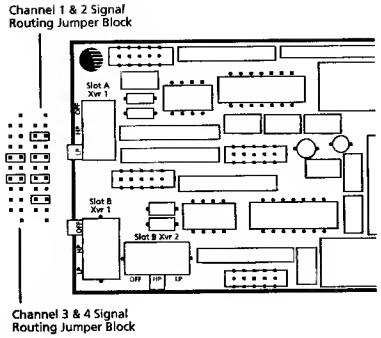
The Concept 97 1 has the ability to route very complex system configurations. We have included the most common configurations. Additionally, an amplifier configuration diagram has been included for your convenience. If you have any questions regarding the signal configurations section of this manual, please refer to your local Authorized ORION dealer or ORION's technical support (1-800-315-2080) for assistance.

4 Channel Input Factory Configuration

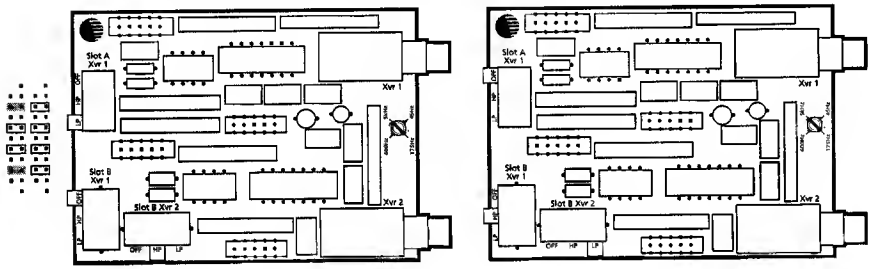


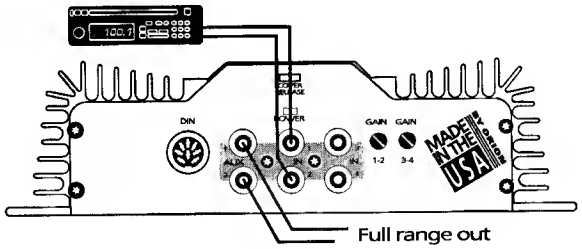
In this configuration, Channels 1 & 2 and 3 & 4 are fed separate incoming RCA inputs. Aux output is full range copy from the input Channels 1 & 2.

NOTE: The signal routing jumpers closer to the crossover module are for channels 1 & 2. The signal routing jumpers closer to the outside of the amplifier are for channels 3 & 4



2 Channel input configuration

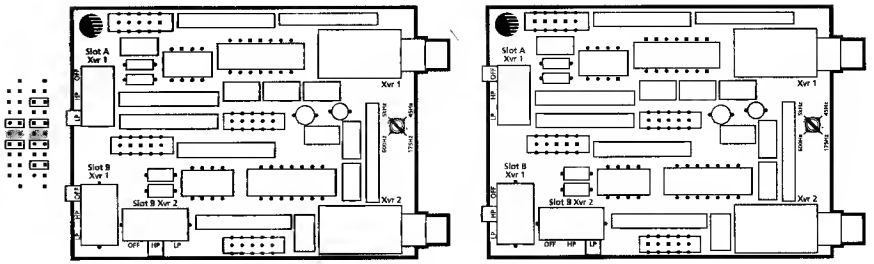




In this configuration, two additional jumpers are added to channels 3 & 4 signal routing block. This allows one set of RCA inputs to feed all channel signals. Aux output is full range copy from the input to Channels 1 & 2.

NOTE: Shaded jumpers are additionally required jumpers not installed in the factory configuration.

Summed Mono Operation



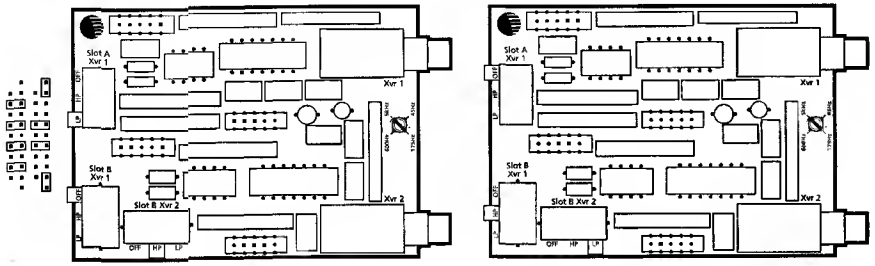
By adding a jumper to the center of the signal jumper blocks, the amplifier output is a sum of both channel inputs. In any configuration, the output of channels 1 & 2 and/or 3 & 4 can be configured for summed mono operation. This is useful for summing left and right channel information to a mono subwoofer. Additionally, this is also useful for bridging two channels with a single RCA input.

NOTE: When Using a single RCA input, a loss of 6 dB signal-to - noise ratio will be lost.

Using the Concept 97 1 in the Master / Slave configuration

One of the very unique applications of ORION amplifiers is the ability to control other ORION amplifier for a perfectly matched system. This feature is primarily used for multi-amplifier subwoofer applications. Using the Concept 97 1 as a master amplifier can only be performed with channels 1 & 2.

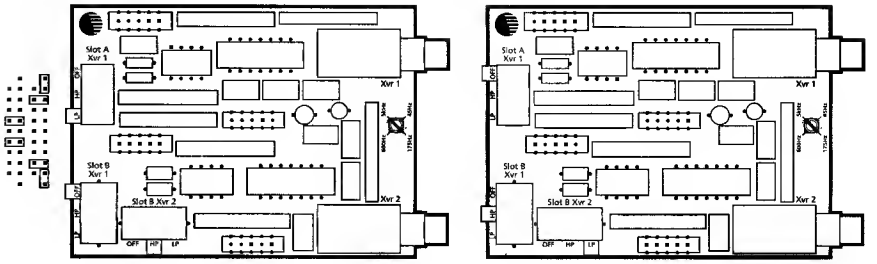
Master Configuration



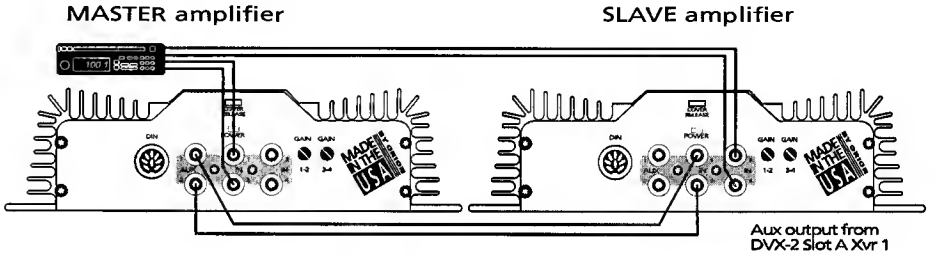
The output of the MASTER amplifier is only designed to operate with amplifier of the same model. With the Concept 97 1, the MASTER/SLAVE configuration is only reserved for channels 1 & 2.

NOTE: If the MASTER amplifier's summed mono jumper is installed in the channels 1 & 2 jumper, all amplifiers connected to the AUX output will also be summed.

Slave Configuration



As a slave amplifier, channels 1 & 2 will track exactly the signal of the master amplifier.

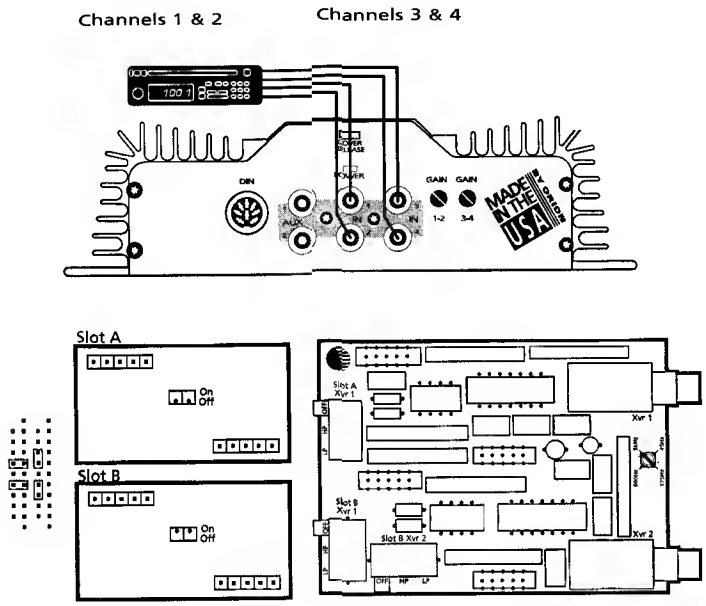


Note: Separate input for channels 3 & 4 can be used by removing jumpers for 2 channel input on master amplifier.

Direct Drive Inputs

Along with the MASTER/SLAVE configuration, the Concept 97 1 can accept direct input, bypassing the internal gain structure. In this configuration, BYP-1 bypass modules must be installed in the amplifier. (SLF-1 crossover modules can be installed in Slot B of both channel 1 & 2 or 3 & 4 module slots.)

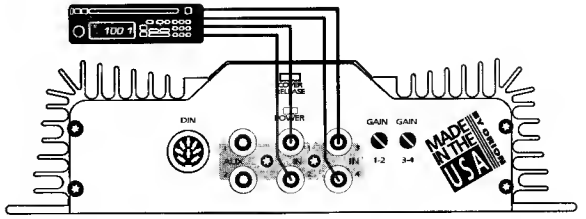
Direct Drive Inputs Channels 1 & 2



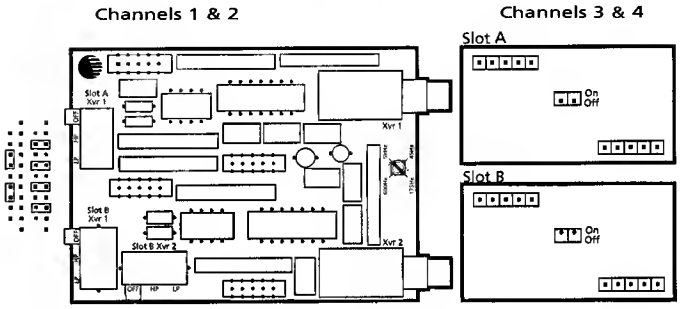
A SLF-1 crossover module can be installed in SLOT-B for channels 1 & 2 for a 12 dB/Octave crossover for channels 3 & 4.

WARNING: The bypass module in SLOT-A for channels 1 & 2 must be switched to the "OFF" position. Failure to do this will result in damage to the amplifier which is not covered under warranty.

Direct Drive Inputs Channels 3 & 4



- Aux output is full range

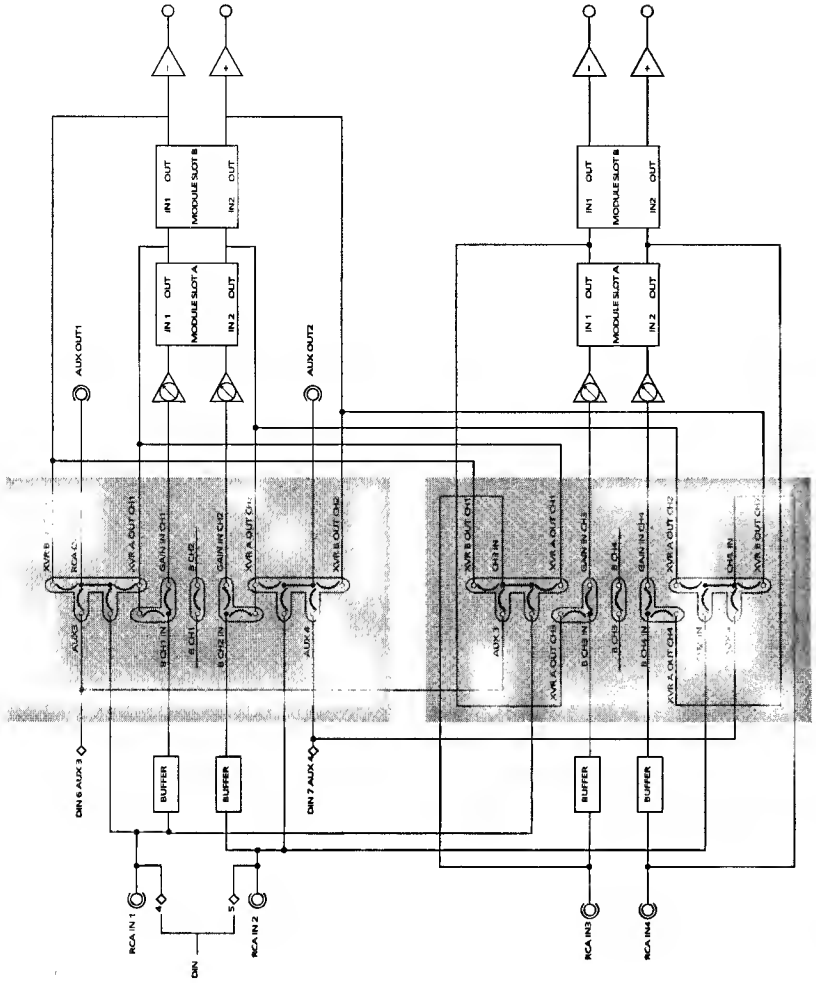


A SLF-1 crossover module can be installed in SLOT-B for channels 3 & 4 for a 12 dB/Octave crossover for channels 3 & 4.

WARNING: The bypass module in SLOT-A for channels 3 & 4 must be switched to the "OFF" position. Failure to do this will result in damage to the amplifier which is not covered under warranty.

Note: For 2 channel input, add jumpers on channel 3 & 4 signal routing jumper block as described in the 2 CHANNEL INPUT CONFIGURATIONS section of this manual.

AMPLIFIER CONFIGURATION DIAGRAM



• Denotes two signal pins that can be connected.

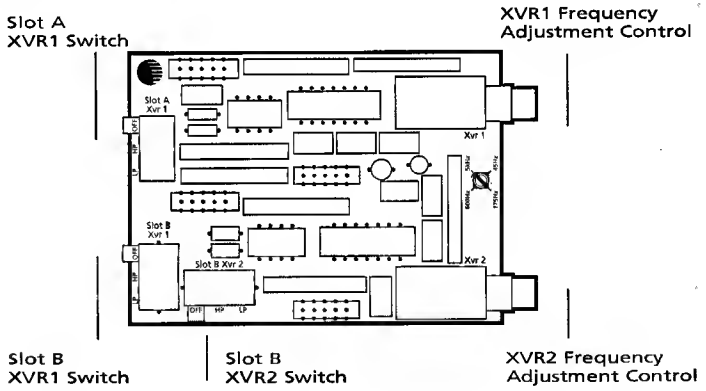
• Denotes two signal pins that are internally connected.

DVX-2 CONFIGURATION

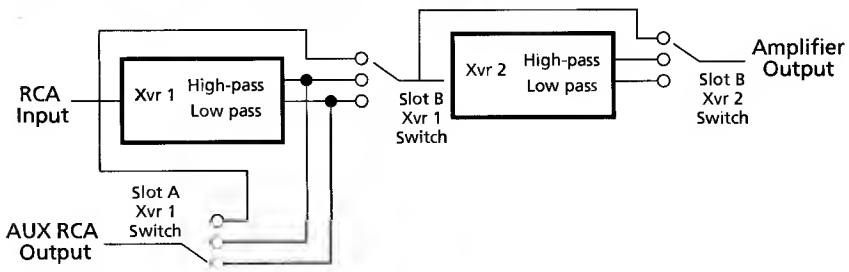
The Concept 97 1 is equipped with two factory installed DVX-2 crossover modules. The DVX-2 is an extremely flexible crossover module that can perform many different crossover functions. Listed are the basic functions of the module.

- 12dB/Octave high-pass or low-pass.
- 24dB/Octave high-pass or low-pass (when crossovers are set to the same frequency).
- 12dB/Octave band pass operation.
- Crossover 1 can independently be routed out the AUX output to an external amplifier. (Applies only when installed in the module slots for channels 1 & 2.)

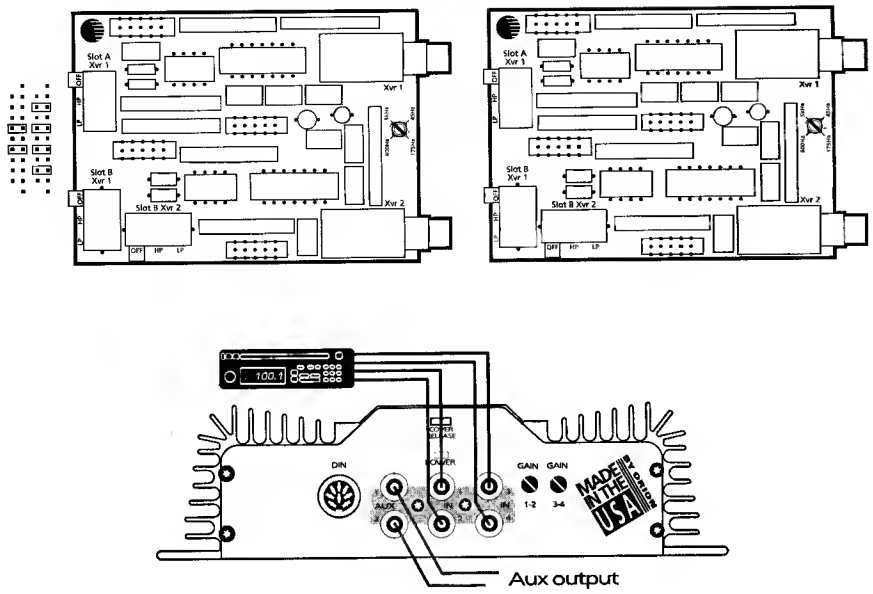
Crossover Call Out



DVX-2 Crossover routing for Channels 1 & 2



Factory Installed Configuration



- DVX-2 crossover adjustments only affect the amplifier output.
- AUX output is full range.
- AUX output is unaffected by internal gain or crossover settings.

Amplifier Crossover selection

The crossover output selection is controlled by the "SLOT-B" "XVR-1" and XVR-2" switches. There are three possible selections:

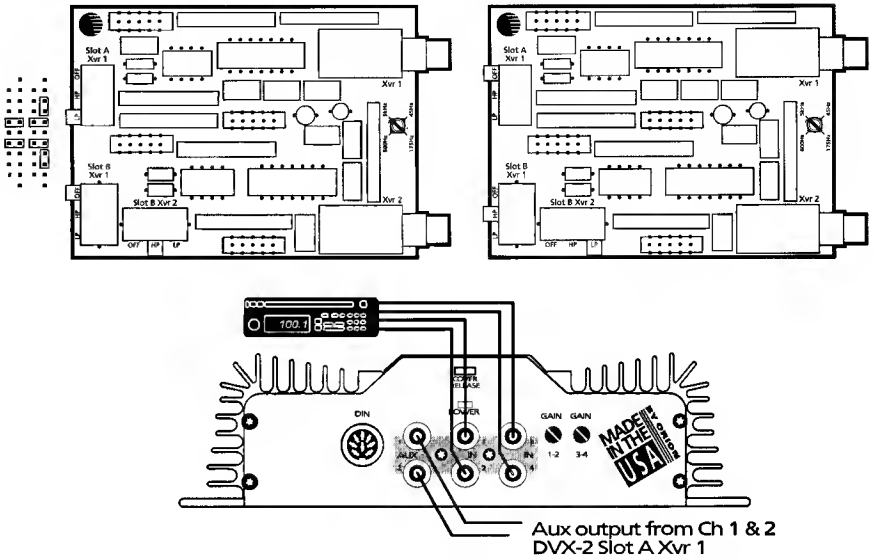
- Off- for crossover bypass
- HP for high-pass
- LP for low-pass.

NOTE: When both "XVR-1" and "XVR-2" are set for high-pass or low-pass operation, the total crossover rate of 24 dB/Octave can be realized when both crossovers are set to exactly the same frequency.

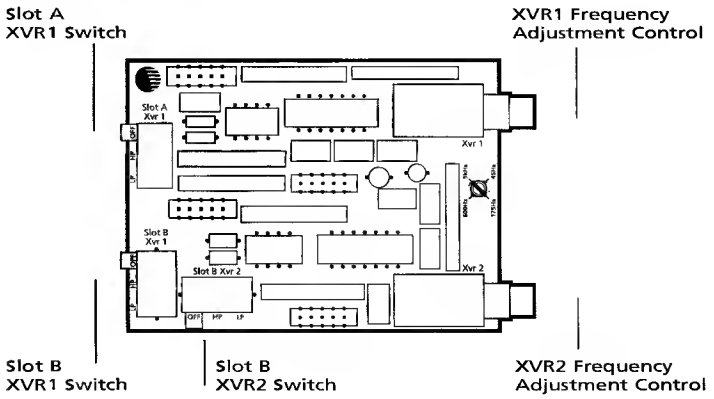
Loop Output Crossover

This configuration is best utilized when only a single 12dB/Octave filter is required for channels 1 & 2. "XVR " is routed out the AUX RCA and "XVR-2" is used for channels 1 & 2 in the amplifier.

Jumper Configuration for Loop Output



- XVR 1 can be selected via "Slot A XVR 1" switch either a high-pass or low-pass for the AUX output.
- AUX output crossover setting is independent of crossover selection for channels 1 & 2.
- AUX output level is affected by gain setting for channels 1 & 2
- Crossover frequency for AUX output is controlled by the "XVR 1 Frequency Adjustment Control"

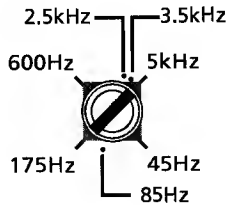


NOTE: the crossover frequency for loop output is set by the "XVR-1 Frequency Adjustment Control" in the DVX-2 module.

Fine Tuning the crossover adjustment

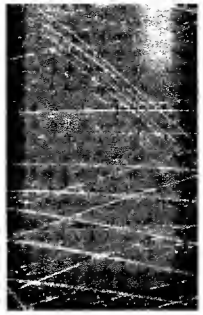
The crossover section is marked at four frequency points for ease of system adjustment. These points are 45 Hz, 175 Hz , 600 Hz and 5,000 Hz. Specific crossover points can be chosen based on the recommended operational bandwidth of your speakers.

There are three small dots on the frequency range dial. These dots represent common used ORION crossover frequencies. These crossover frequencies are 85 Hz, 2,500 Hz and 3,500 Hz respectively.



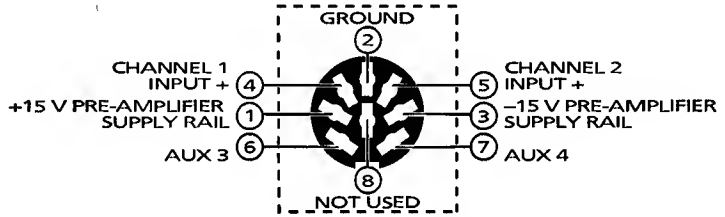
When using ORION loudspeakers, minor deviations from the recommended frequency ranges can provide superior results depending on speaker location and vehicle acoustics. Setting crossover frequencies higher than recommended will not cause damage and may provide superior sonic results depending on your system's performance goals. Refer to your loudspeaker owner's manual for assistance in choosing the proper crossover frequencies for your system.

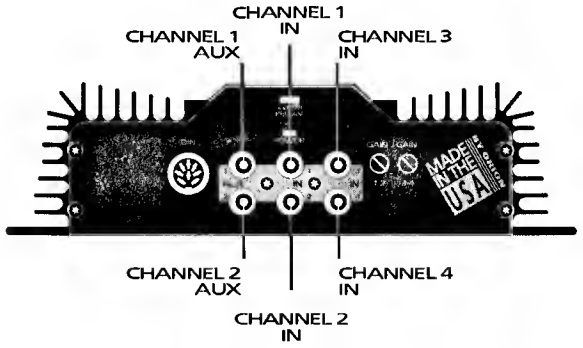
WARNING!!! DO NOT set crossover frequencies lower than the speakers recommended operating range. This can cause driver failure not covered by manufacture warranty.



DIN INPUTS AND PHANTOM POWER

DIN connection can be used for full range output, power for full range output, power for external Orion accessory or input from another Orion amplifier.





OUTPUT LEVEL ADJUSTMENT

Concept 97 1 amplifiers have separate channels 1 & 2 and 3 & 4 level adjustments. The input sensitivity of these adjustments range from 200mV up to 5Vrms. This allows easy integration with any OEM (Original Equipment Manufacturer) or aftermarket source unit. Refer to the Testing the System and the Adjusting the Sound of the System for detailed instructions on level setting

CHOOSING MOUNTING LOCATIONS

The location of your Concept 97 1 amplifier will depend on several important issues. Due to the low profile size of the Concept 97 1 amplifiers, there are many possible installation locations that will yield satisfactory amplifier performance.

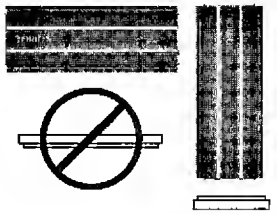
- Always mount the amplifier in a place that protects the amplifier from the elements.
- Mount the amplifier on a stable flat mounting surface.

As with any amplifier, there are several possible mounting locations and configurations that can be optimal. We will cover the most obvious of situations.

passenger compartment mounting

If you are going to mount the amplifier in the passenger compartment, make sure you have adequate room for ventilation. The Concept 97 1 amplifiers have been designed with a low profile to make possible under seat mounting. When mounting your amplifier under a seat or similar area, keep a minimum of 1" of clearance around the amplifier for adequate cooling.

trunk compartment mounting



Mounting the Concept 97 1 amplifier in the trunk provide excellent performance as long as you do not mount the amplifier upside down or restrict the airflow around the Heatsink of the amplifier. For optimal results, mount the amplifier with the cooling fins in the vertical position. This type of mounting will yield the best cooling due to the convection effect across the amplifier chassis.

engine compartment mounting

Do not mount the Concept 97 1 amplifier in the engine compartment. The amplifier was not designed to endure the harsh environment of the exterior elements, and may cause damage that is not covered under warranty.

GENERAL PRE-CAUTIONS AND INSTALLATION TIPS

- Be careful not to cut or drill into gas tanks, fuel lines, brake lines or hydraulic lines, vacuum lines or electrical wiring when working on your vehicle.
- Disconnect the vehicle's ground wire at the battery before making or breaking connections to the audio system's power supply terminals.
- Do not use the Concept 97 1 unmounted. Failing to securely mount the amplifier can result in damage or injury, particularly in the event of an accident.
- Never mount a Concept 97 1 where it might get wet or be exposed to moisture.
- Mount the Concept 97 1 amplifier so the wire connections will not be pulled.
- Route the wires where they will not be scraped, pinched or damaged in any fashion.
- The +12V power supply wire must be fused within 18" of the battery terminal. Use the recommended fuse size or circuit breaker listed in the POWER CONNECTIONS section of this manual.
- If you need to replace the fuse plugged into the side of the Concept 97 1 amplifier, replace the fuse with the same size and type fuses that came with the amplifier.
- If you are not sure as to the correct value, refer to the POWER CONNECTIONS section of this manual for proper fuse size. Using a higher current fuse may result in damage to the Concept 97 1 amplifier which is not covered under warranty.
- NOTE: Make sure all the equipment in the system is turned off when making or breaking connections to the Concept 97 1 input RCAs or speakers terminals. Turn on the system and slowly turn up the volume control only after double checking all wire connections.

- Power for systems with a single Concept 97 1 amplifier can be accomplished by most automotive electrical systems. Systems with multiple amplifiers may require a higher capacity battery/s, alternator or the use of a storage capacitor. We strongly recommend the use of transient storage capacitors MBR70 and an extra battery in larger stereo systems.
- Concept 97 1 amplifiers generates a certain amount of heat as part of its normal operation. Be sure the area around the cooling fins is unobstructed to allow adequate air circulation.

STEP BY STEP INSTALLATION INSTRUCTIONS

Step 1 Determine the location for the amplifier. Refer to the MOUNTING LOCATIONS section in this manual for detailed information.

Step 2 Decide on the system configuration for your amplifier. For system suggestions, refer to the SYSTEM PLANNING section of this manual.

Step 3 Run all the wires from the amplifier location to the speakers, source unit and battery. Do not connect the battery at this time. Be sure to run audio, power and speaker wires away from factory electrical wires and system, as they pose a great potential for induced system noise.

Step 4 Pre-drill amplifier mounting holes. Be sure to **"Think before you drill"**. Gas tanks, fuel lines, and other obstructions have a way of hiding themselves. For best results use a marking pen to mark the mounting holes and pre-drill these holes with a standard 1/8" drill bit.

Step 5 Mount the amplifier. Make sure the amplifier is mounted on a flat surface. If this is not possible. Do not over tighten the screws such that the chassis of the amplifier is twisted or bent.

Step 6 Turn the vehicle's key switch to the off position.

Step 7 Disconnect the vehicle's battery ground terminal.

Step 8 Connect the RCA and speaker wires to the amplifier. Check the quality of your speakers and signal connections. This will determine the ultimate performance of your ORION amplifier. Refer to the INSTALLATION QUICK REFERENCE section of this manual for correct wiring instructions.

Step 9 Connect power wires to the amplifier. At this time do not connect the fuse at the main battery.

Step 10 Reconnect the ground terminal to the battery.

Step 11 Set crossover and signal routing configurations. Refer to the SIGNAL ROUTING SWITCHES and the DVX-2 CONFIGURATION SECTIONS of this manual for detailed instructions.

Step 12 Once satisfied that all connections and settings are correct, install fuse located near the vehicle's battery and proceed to the TESTING THE SYSTEM section.

WARNING!!!! Never exceed the recommended fuse size of this amplifier. Failure to do so may cause damage to the amplifier that is not covered under warranty.

TESTING THE SYSTEM

After you have completed the installation, the next step is to test the system. This will help ensure years of trouble free operation. Please refer to the listed steps below when testing the sound of your ORION Concept 97 1 system.

Step 1 Check all the wiring connections to be sure they are correct and secure.

Step 2 Turn the signal source volume control down all the way. Set any tone controls to their flat or defeated positions.

Step 3 Turn the level controls of the amplifier to their minimum positions.

Step 4 Turn the source unit on. Check to see if the remote power LED located on the connection side of the amplifier is lit. If not, please refer to the INSTALLATION QUICK REFERENCE section and the TROUBLE SHOOTING section of this manual for instructions.

Step 5 If using a aftermarket source unit, turn the gain controls of the amplifier about one quarter of a turn. Slowly increase the volume level of the source unit so that you can hear the output of the system. If no sound is heard or if the output is distorted, turn the system off immediately. Refer to the INSTALLATION QUICK REFERENCE section and the TROUBLE SHOOTING section of this manual to solve your installation problems

Step 6 Check to make sure the output for each channel is correct. If the active crossovers are used, check to make sure that each output is correct from the amplifier. When using active crossovers on midrange and tweeters, do not use crossover frequencies lower than recommended. If the system is not configured properly, refer to the DVX-2 CONFIGURATION section of this manual and take corrective action.

Step 7 If the output is clear and undistorted, continue to the ADJUSTING THE SOUND OF THE SYSTEM section of this manual.

ADJUSTING THE SOUND OF THE SYSTEM

Once you have checked the system's operation, adjust the sound of the system. Adjusting the sound of the system is accomplished by setting the gain controls and adjusting the internal or external crossovers.

Step 1 Turn the signal source volume control down all the way. Set any tone controls to their flat or defeated positions.

Step 2 Turn the level controls of the amplifier to their minimum positions.

Step 3 Choose music with high dynamic content that you are familiar with and most often used in the system.

Step 4 Turn the unit up to its highest undistorted output level. If you lack test equipment, this point occurs between 3/4 to full volume depending on the quality of your source unit. Listen for any audible distortion, if any distortion is audible, reduce the volume of the source unit until you have an undistorted output. Leave the volume control at this position during your system tuning.

Step 5 While listening to your chosen music, turn up the level control corresponding to the midrange output until you hear slight distortion and turn back the level control slightly for an undistorted output. Depending on your system the midrange and tweeter output may be on the same output channels.

Step 6 Turn up the level control corresponding to the tweeter output until you hear slight distortion and turn back the level control slightly for an undistorted output. Depending on your system the midrange and tweeter output may be on the same output channels.

Step 7 Fine tune crossover setting and output level between midrange and tweeters. Refer to the DVX-2 CONFIGURATION section of this manual for detailed instructions.

Step 8 Repeat Steps 5-7 for the rear speakers. If you do not have rear speakers continue to Step 10.

Step 9 Set levels between the front and rear midrange and tweeters for optimum front/rear balance.

Step 10 Turn up the level control corresponding to the woofer output until you hear slight distortion and turn back the level control slightly for an undistorted output.

Step 11 Fine tune crossover setting and output level between satellite speakers and the woofers. Refer to the DVX-2 CONFIGURATION section of this manual for detailed instructions.

Step 12 Enjoy your awesome ORION sound system.

WARRANTY

Material and workmanship under the following terms:

PARTS and LABOR are warrantied for a period of (2) years from the date of the first consumer purchase from an Authorized ORION Dealer. Except as specified below, this warranty covers ALL defects in material and workmanship in this product. The following are NOT covered by this warranty:

1. **Any product which is NOT purchased from an Authorized ORION Dealer. If you are uncertain as to whether your dealer is authorized, please contact ORION at (602) 730-8200. In countries other than the USA, each distributor warranties the ORION products which it sells. (If product is purchased from a non-authorized dealer, the warranty is 90-days from date of purchase).**
2. **Any product on which the serial number has been defaced, modified or removed.**
3. **Damage or malfunction resulting from;**
   a. **accident, misuse, abuse, unauthorized modification or failure to follow the instructions provided with the product**
   b. **repair by anyone NOT authorized by ORION**
   c. **damage due to shipping (these claims must be presented to the freight carrier)**
   d. **removal or installation of the product**
   e. **any failure that has NOT been caused by a defect in material or workmanship.**

This warranty is in effect for the original purchaser only. ORION will pay for labor and material expense for covered items. ORION does not cover removal or installation charges, payment of shipping charges to ORION, payment of OUT-OF-WARRANTY shipping charges, or damage to other property caused by any defects in this product.

For IN-WARRANTY service you must include a copy of the original, dated sales receipt, including serial number, from an Authorized ORION Dealer. Please also enclose your name, return street address (No P.O. Boxes) and a detailed description of the problem.

Exclusion

1. This warranty is in lieu of all other warranties expressed or implied.
2. In no event will ORION be liable for any consequential damages resulting from use of the products or any defect in the product.

This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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